

The Mining Journal

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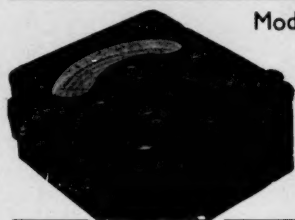
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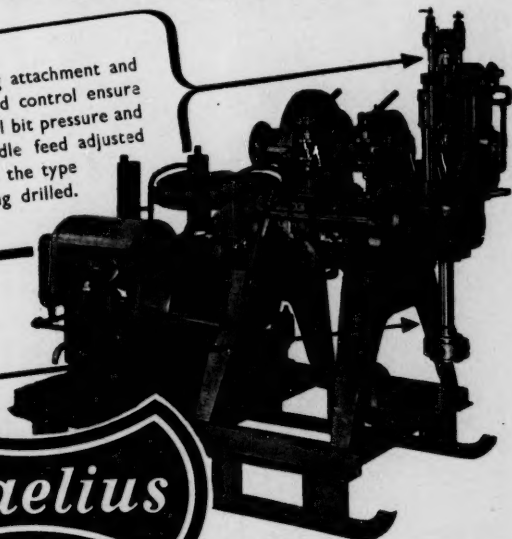
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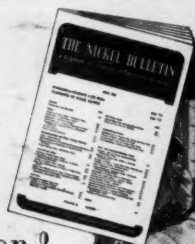
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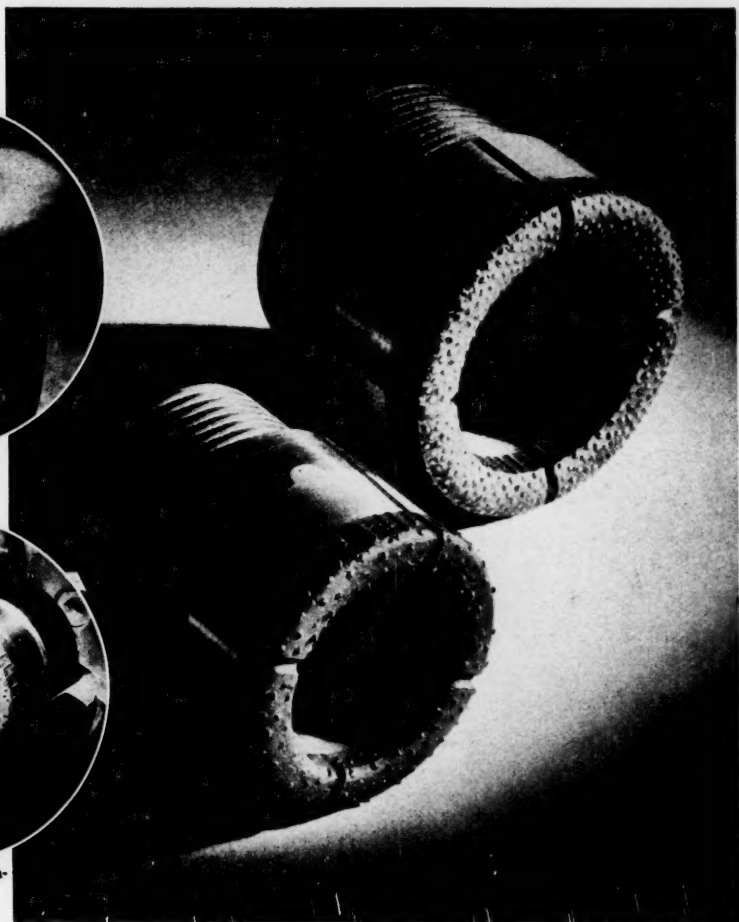
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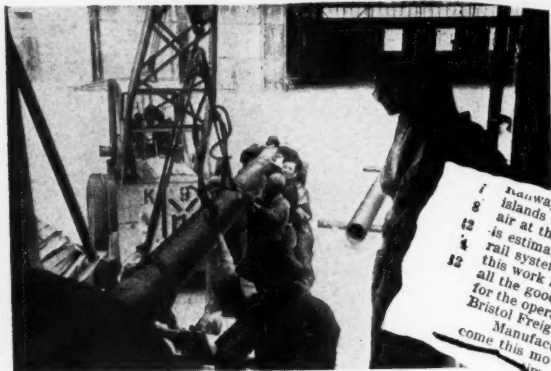
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"WHITE'S AVIATION"—N.Z.
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THIS WEEK'S FEATURES

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NOTES AND COMMENTS

Ministry of Materials Bill

The Government secured a majority of 19 in the House of Commons on Wednesday for the Bill to set up a Ministry of Materials. As an administration measure this was bound to pass, but it cannot be said that the measure met with any degree of acceptance. The complexity of a third department intervening between the producer, and the industry as consumer was generally stressed. It is self-evident that no new department is going to create a larger supply of materials in which there is a world famine and Mr. Stokes was unable to say anything definite as to how this responsibility for looking after home and overseas development with a view to increasing supply would be integrated. He said that the question of exploration was advisedly left out of the Bill in order to avoid complications, but if he had not the necessary powers, he saw little difficulty in the way of acquiring them. A superficial reading of a lengthy speech rather suggests that Mr. Stokes' success in his talks with the American administration and other leaders would lead to closer and more fruitful co-operation and when allied to his new powers would be more effective than anything in the Bill itself, and this was a welcome change from the spirit of antagonism to the United States which the late President of the Board of Trade, Mr. Harold Wilson, sought again to emphasize. Much of the trouble which we experience to-day seems to stem from the fundamental incompatibility of view between Government control and the free operation of private trade. Industry must derive what comfort it can from Mr. Stokes' own industrial background, and Mr. Gaitskell's hope that the raw materials situation, while still extremely serious, had improved in the last few weeks.

The Steel Squabble

Since Mr. Strauss and his Board of Management, the Iron & Steel Corporation, assumed responsibility for the supreme control of the steel industry four and a half months ago, they have been admittedly batting on a sticky wicket. Production has fallen at a time when more, not less steel was urgently needed and costs of production

have been inflated to such an extent that probably every ton of steel now produced is being sold at a loss. Nevertheless, the Minister of Supply was both unjust and indiscreet when he attempted as he did last week to put the blame upon the British Iron & Steel Federation. Indiscreet, because the Federation like that "dangerous" animal the lion, has developed a tendency when attacked, to defend itself and unjust as is shown by a bare citation of the facts.

Accused of deliberately running down stocks of raw materials to such an extent that when the industry was transferred to public ownership in February last, "the cupboard was nearly bare," the Federation promptly published the figures which show that on vesting date the tonnages of pig iron and scrap in stock were substantially higher than they were in the corresponding date in 1948 and 1949. As for pig iron ore the imports fell away during the winter months and have not since been fully restored, not because sufficient ore was not purchased, but because there was a lack of shipping to ferry the material to British ports, a lack caused in part by the Korean war, and seriously aggravated by the decision to import American coal. If any accusations are to be launched about the scarcity of raw materials it would appear that it is the Government not the Federation which should be indicted.

Upon this flimsy foundation the Minister bases his claim that the raw materials purchasing organization, the British Iron & Steel Corporation Ltd. and B.I.S.C. (Ore) Ltd. should be placed under the control of the Steel Corporation, and resistance by the Federation is condemned as mere obstructionism. The Federation view is that their subsidiaries which are engaged in the acquisition of raw materials, are operated in the interests of privately owned as well as nationalized undertakings and that it is in the interests of efficiency that one central organization should act for both. If on the other hand the State Corporation's demands were conceded, the effect would be to place within its orbit trading concerns which were specifically excluded by the Iron & Steel Industry Act. Mr. Strauss threatens drastic action if the Federation refuses to capitulate, and accuses the latter of trying to thwart the will of Parliament. But the Federation is sticking to its guns and has yet not yet exhausted its powers of resistance.

"Gold Revaluation Inevitable"—Mr. Hagart

Addressing the Annual Meeting of the Transvaal Chamber of Mines this week, the President, Mr. R. B. Hagart, emphasized that notwithstanding the fact that America appeared to be determined to keep the monetary price of gold as cheap as she could, some revaluation of gold throughout the world seemed eventually inevitable. The existence of large private hoards of gold indicated diminishing confidence in inconvertible paper currencies which would lead to increasing pressure for a more realistic monetary price of gold. The gold mining industry in 1950, though outwardly tranquil, had in reality been beset with many and varied difficulties arising largely from political unrest in the world causing ever-growing inflationary pressure and shortages in nearly every important category of goods and services. Nevertheless, progress had been considerable and in the circumstances quite satisfactory. However, the basic fact remained that every increase in the cost of producing gold placed unmined ore beyond economic reach and Mr. Hagart gave the warning that "unless the rise can be curbed, the advantages of devaluation will be rapidly nullified."

Although the 1950 working profit increased to about £53,700,000, the State had taken about £22,500,000 in taxation and in its share of profits, yet the Minister of Finance had announced that the formula tax rate would be increased 5 per cent this year. This was to be deplored at a time when the provision of enormous capital sums for the industry, principally for the development of new mines, was one of the most pressing problems.

Turning to industrial gold, Mr. Hagart said it would seem that demand for supplies would continue for some time to come. The magnitude of sales in the past twelve months had demonstrated that there was heavy and persistent demand for gold by the peoples of the world and at prices considerably higher than the statutory prices fixed by governments and he reiterated that "there remains a world-wide and unassailable faith in gold as a real safeguard against the loss of savings by the progressive depreciation of paper currency."

Last year, an additional amount of £2,123,547 accrued from these sales and in the first five months of 1951, 2,000,000 f.o.z. had been sold, resulting in a net additional amount of £3,427,000 for South African producers.

Referring to the future of the industry, Mr. Hagart said the near future, from the production point of view, would be largely dependent on the older mines of the Witwatersrand and its Far Western extensions, where the position was inherently sound.

Mr. Hagart's concluding remarks had a confidential ring: he stated that even though the rise of working costs and the difficulties of obtaining adequate supplies of labour, might be some cause for concern, output of gold should be well-maintained and the prospect can be viewed optimistically. From now onwards, new and large mines, especially in the Orange Free State, would move into the production field helping gradually to improve the overall position. Thus, "gold mining will for long continue to be a vital factor in the fuller development of South Africa's economic progress and stability."

Manpower for the O.F.S.

At the annual general meeting of the Anglo American Corporation held in Johannesburg last week, Sir Ernest Oppenheimer had some interesting observations to make regarding the supply of capital and labour for the developing mines in the O.F.S., some of which will shortly be commencing production.

Pointing out that £65,000,000 had already been provided for the development of the new field, quite apart from

several million which had been provided for laying out townships and providing amenities, he reaffirmed his view that although large additional supplies of capital will still be required, the major part of the task of financing the new field has been successfully accomplished.

It is clear from Sir Ernest's remarks that the principal potential bottleneck with which the Corporation is now grappling is the availability of labour, both skilled and unskilled. Hitherto, the problem has not been acute, because while the majority of new mines are still at the shaft sinking stage, the amount of labour which can be deployed is limited. Once the shafts are sunk, however, and development—and subsequently milling—begins, the overall requirements both for the thirteen mines in the O.F.S. and for the developing mines in the Klerksdorp district and on the West Wits. line, will rise steeply.

The extent of the problem can be gauged from the fact that the projected milling capacities of these seventeen developing mines total between 30 and 40 per cent of the output of all existing Rand producers. The mining companies have, of course, long been aware that this problem would arise and from the beginning, the layout and equipment of the O.F.S. mines were planned with a view to maximum mechanization of all operations. While this will result in easing somewhat the demands on native labour the need for skilled mechanics and artisans to operate and maintain this labour-saving machinery is considerably increased at a time when these skills are already in short supply.

In the case of both skilled labour and native labour, the Anglo American Corporation has given a lead in recognizing the necessity both of adequate training facilities and of ensuring that the working and social conditions on the mines are sufficiently attractive to compete with the demands for labour in the growing secondary industries. In particular, the development of the new townships of Welkom and Allanridge by the Corporation are clearly going to provide attractive residential areas with amenities far in advance of those available to many mining communities, and they should assist the efforts which are being made to encourage skilled European labour to emigrate to the O.F.S.

Even more noteworthy has been the approach to native amenities both in the provision of canteens and dormitory blocks, setting new standards of nutrition and hygiene, and in the establishment of model villages for married employees, with a view to establishing the nucleus of a permanent labour force of key native personnel. Native health standards, already good on the Rand, will receive even closer attention.

Under conditions of increasing labour shortage, the productivity of native labour also assumes increasing importance. Sir Ernest points out in this connection that the tonnage milled per head of the native labour force on the Rand increased by about 3 per cent last year, despite the fact that during the year there was an increase in development footage of 7 per cent over 1949. Productivity will, of course, be higher on the O.F.S. mines on account of the increased mechanization which has been planned.

It will be interesting to watch the development of the Corporation's experiments with the establishment of a permanent labour force such as exists, for example, in the mines of the Congo. One of the consequences attributed to this policy in the Congo has been the gradual assumption of skilled tasks by native labour, and while the social climate is at present hardly suitable for this in the Union, some development along these lines may ultimately have to be considered if adequate supplies of European labour are not forthcoming.

India

(From Our Own Correspondent)

Colombo, June 6

The U.S. Government has not approached the Government of India to increase manganese exports. This statement was made in the Union Assembly at New Delhi by Mr. H. Mahatab, Minister of Commerce and Industry, in reply to a question. A quota of 1,000,000 tons of high-grade manganese ore and an unlimited quantity of low grade ore, said Mr. Mahatab, had been fixed for export in the current year. There was no destination control over exports of manganese ore and it could not, therefore, be said as to how much of it would be exported to the United States. Last year, India exported to the U.S. 530,835 tons of manganese ore, 11,107 of kyanite ore and 35,227 tons of ilmenite ore.

It was also stated that the Government did not propose to lift the embargo on shipments of monazite sands, imposed on May 17, 1947. This embargo applied not only to the U.S., but to all countries. The U.S. Government did not ask India recently to lift this embargo.

Mr. Sri Prakasa, Minister for Natural Resources and Science, denied that U.S. interests had been licensed to purchase most of India's current beryl output.

METALLURGICAL RESEARCH WORK

Experiments undertaken at the National Metallurgical Laboratory, Jamshedpur, India, indicate that the manufacture of mild steel, having superior qualities, similar to those of low alloy steels, is possible in India. The process, which involves controlling the austenitic grain size of steel, will help not only to produce steels of required specifications, but will also enable India to put to better use imported alloying elements.

The Laboratory has also successfully carried out investigations on the separation of cryolite from carbon dust, produced in the aluminium reduction furnaces. About 150 tons of cryolite (costing approximately Rs.150,000) lost annually through the carbon dust, can thus be reclaimed. The benefits derived from this investigation will be more evident with the increase in the production of aluminium in India.

Another aspect of work undertaken in the Laboratory is on beryllium, which the Laboratory proposes to produce on a semi-pilot plant scale.

Portugal

(From Our Own Correspondent)

Oporto, June 16

This year has been fertile in surprises for the mining trade here. First came the bombshell of the impost of Esc. 36 per kilo on wolfram ore, followed shortly by another of Esc.40 per kilo. This new tax was in no way helped by the fact that for 14 days both taxes were enforced. The ensuing muddle was finally cleaned up and the position now is as follows: normal wolfram pays Esc.40 per kilo of material; tin concentrates pay only Esc.810 per tonne; wolfram residues, not exceeding 25 per cent WO₃, pay Esc.16 per kilo; tin residues, a merely nominal tax per kilo. The trade here hopes that no further "accomplished facts" will be sprung upon it. Needless to say, these measures neither help business nor inspire confidence.

Output figures for the first quarter of the year are: WO₃, 910 tonnes; tin ore, 340 tonnes; cupreous pyrites, 180,783 tonnes.

Exports for the first four months of the year are: WO₃, 1,030 tonnes; tin ore, 295 tonnes; cupreous pyrites, 180,457 tonnes; manganese, 4,300 tonnes; white arsenic, 123 tonnes; tin metal, 2,175 tonnes.

Platinum Metals in the U.S.A.

Reversing a trend downward that had persisted for several consecutive years, the demand for platinum rose sharply in 1950, particularly in the second half, according to the U.S. Bureau of Mines. Demand for palladium also was substantially larger, although the quantity sold was less than half that of platinum. Demand for iridium, osmium, rhodium, and ruthenium was at a much higher level, with rhodium showing the greatest percentage increase in sales. During the latter part of the year, the demand for platinum was far in excess of supply, causing some dealers and refiners to follow a policy of rationing. The increase in activity in the platinum-group metals in 1950 was connected largely with requirements for the military programme and expansion of defence industries.

DOMESTIC SALES

Total domestic sales of platinum were 102 per cent greater in 1950 than in 1949. As is normal, the jewellery trade provided the largest market, taking 41 per cent of the sales to domestic consumers. By per cent, sales to jewellers were considerably less than in 1949, however, due to a very large decrease in the fourth quarter. The chemical and electrical industries accounted for 37 and 15 per cent, respectively, of the domestic consumption of platinum in 1950, with most of the activity in the third and fourth quarters. Refining of platinum in the U.S. and imports of refined platinum, were at rates substantially greater than in 1949, but resulted in a total supply below the demand; the deficiency was met by withdrawals from stocks of refiners and dealers.

Total domestic sales of palladium were 29 per cent greater in 1950 than in 1949. Domestic consumption in the principal uses was as follows (in per cent): Chemical, 11; electrical, 53; dental and medical, 12; jewellery and decorative, 23; and miscellaneous less than one. By quantity most of the increase in sales was absorbed by the chemical and electrical industries.

Domestic refining of new platinum-group metals in 1950 was 41 per cent more than in 1949. Twenty-two per cent of the new metal was obtained from domestic crude platinum (mostly from Alaska), 57 per cent from foreign crude (mostly from Colombia) and 21 per cent as a by-product of gold and base metal ores.

Platinum-group metals recovered by U.S. refiners in 1950 (troy oz.)

	PLATINUM	PALLADIUM	IRIDIUM	OSMIUM	RHODIUM	RUTHENIUM	TOTAL
From domestic materials:							
Crude platinum	14,379	37	1,131	278	251	22	16,098
Gold and copper refining ...	3,722	11,533	93	—	134	27	15,509
	18,101	11,570	1,224	278	385	49	31,607
From foreign crude platinum	38,656	249	1,127	1,017	48	425	41,522
Total:							
1950	56,757	11,819	2,351	1,295	433	474	73,129
1949	42,228	6,008	2,131	980	208	371	51,926

Secondary platinum-group metals recovered in 1950 (figures for 1949 in brackets), comprised 33,894, (41,734) oz. platinum; 21,167 (37,209) oz. of palladium; 1,064 (1,101) oz. of iridium; 421, (555) oz. of osmium; 414, (569) oz. of rhodium, and 1,153, (2,279) oz. of ruthenium—a total of 58,113, (83,447) oz. Substantial quantities of worn-out catalysts, spinnerets, laboratory ware, and other equipment are returned by industry to refiners for refining or reworking. The refined platinum metals recovered from these products (or their equivalent in refined metals) are returned to the consumers. The platinum metals so recovered are not regarded as secondary production, nor are they included in the figures for secondary metals.

IMPORTS LARGEST ON RECORD

Imports of platinum-group metals refined and unrefined, into the U.S. were 96 per cent more than in 1949 and were the largest on record—amounting to 427,622 oz., compared with 218,284 oz., in 1949. The principal sources were Canada (192,906 oz.), Colombia (35,605 oz.), U.K. (97,814 oz.), U.S.S.R. (45,896 oz.) and Switzerland (8,053 oz.).

Exports of platinum were 12,753 oz. (18,150 oz. in 1949), and those of the other platinum-group metals were 24,946 oz. (22,628 oz. in 1949):

The Problem of Copper Supply

The President of the Anaconda Copper Mining Co., Mr. W. H. Hoover, in an address at the Montana School of Mines on June 9, outlined the problem of the need for copper in the United States and elsewhere in relation to output, actual and potential. The broad facts of the situation are no doubt familiar to most of our readers from many earlier pronouncements, but their collation into a broad, general picture is more impressive than the tabulation of a number of isolated statements.

U.S. PRODUCTION AND DEMAND

Mr. Hoover pointed out that so far, as domestic production of the United States is concerned, its capacity to produce primary copper had varied little in the last thirty years, but that the demand had increased enormously. In the first forty years of this century the U.S. exported over 4,500,000 s.tons of copper, with a peak production in the first world war of approximately 955,000 s.tons, which was exceeded in 1939 with a total of roughly 1,000,000 s.tons. The largest output ever attained was 1,090,000 s.tons in 1943. From 1940 onwards the U.S. became an importer of copper, and in the decade ending last year imported 4,500,000 s.tons.

Mr. Hoover placed world producers as 1, U.S.A., 2, Chile, 3, N. Rhodesia, 4, Canada, 5, the Congo; and thought that the Soviet production might be one-fifth of that of the U.S., or say 200,000 s.tons. He stated that the N.P.A. estimated that there would be available for all U.S. requirements, including stockpile, this year approximately 1,516,000 s.tons of copper. Were civilian uses to continue at the rate of 1950, these alone would require 1,600,000 s.tons, as against a domestic total of primary production and secondary intake of some 1,075,000 s.tons, thus suggesting the necessity of importing some 450,000 s.tons. Automobile transport alone called for some 800,000 s.tons a year.

NO IMPORTANT DEPOSITS DISCOVERED IN U.S.

N.P.A. estimates of requirements for military and military supporting programmes for the second half of this year were that they should reach 45 per cent of the available copper, and at the beginning of next year possibly

Total sales of platinum-group metals to domestic consumers were 495,945 oz., an increase of 72 per cent over sales in 1949 and the largest since 1945. Sales of platinum to domestic consumers were 308,998 oz., equivalent to 62 per cent of the total sales of the group. Corresponding figures for 1949 are 152,658 oz. and 53 per cent.

INCREASING SALES FOR CHEMICAL USES

A feature of 1950 was the close approach in sales of platinum for chemical uses to those for jewellery and decorative uses. Noteworthy were the very large sales to the glass industry.

Sales of palladium were 150,456 oz., equivalent to 30 per cent of the total sales of platinum-group metals, compared with 116,235 oz. and 40 per cent in 1949. As is normal, the electrical industry was the largest buyer, followed by the jewellery industry. Of interest is the large gain in sales for chemical uses.

Sales of iridium, osmium, rhodium and ruthenium together comprised 7 per cent of the total platinum-group metals sold in 1950. By quantity, their sales were as follows (in oz.): iridium, 9,989; osmium, 2,797; rhodium, 14,376, and ruthenium, 9,329. A total of 36,491.

Stocks of platinum-group metals held by refiners, importers, and dealers were 266,562 oz. on December 31, 1950, a decrease of 10 per cent from December 31, 1949.

80 per cent of the total supply. There was little hope that production could be quickly stepped up to meet both normal civilian requirements and the armament programmes. No new deposits of substantial tonnage had been discovered in the U.S.; those which could be brought into production were marginal and had not been worked for many years, and it would require between two and five years to reach the producing stage.

Mr. Hoover gave some details regarding new construction for army, navy and air requirements which are illuminating. The principal consumption demands for the army were for ammunition, and for rotating bands for projectiles of which Anaconda had produced 100,000,000 during the last world war. Naval appropriations, amounting to \$2 billion, were divided almost equally between new construction and the reconditioning of the 2,200-ship "mothball" fleet. The latest 4,500-ton destroyers, without including armament, each required about 700 s.tons, battleship over 3,000 s.tons, an aircraft carrier slightly under this weight, and a submarine slightly over 300 s.tons. As regards air force requirements, approximately 4,000 s.tons of copper had been allocated during the second quarter of the current year towards the production of the 95-Group Air Force projected. In the last two years of the late war 52,000 s.tons had been allocated quarterly. The new tanks, 60 per cent more powerful and 50 per cent faster than previous models, required from .08 to 1.6 s.tons apiece, exclusive of armament. Sixty divisions of 150 tanks each would, it was believed, consume 10,000 s.tons of copper for construction alone.

U.S. NEED FOR COPPER IMPORTS

Summing up, Mr. Hoover judged that the United States need for copper imports was likely to continue into the indefinite future. During the period of rearmament many civilian uses of copper must be restricted, and in some instances, discontinued, but some 50 per cent of its various applications were entirely indispensable. There was not sufficient copper available to supply the needs of both armament and civil requirements. There were adequate supplies for rearmament and some of the more essential needs of peacetime.

Research on Pumping Problems

The need to save energy, particularly in continuous plant operation, assumes increasing importance at a time of rising production costs. Since hydraulic equipment of various kinds is used on a large scale in mining, the activities of a relatively young, but by no means unimportant research association—the British Hydromechanics Research Association—deserves the widest attention and support. A survey of its activities forms the subject of the following article.

It is not generally realized how much mechanical energy costs, both in direct capital and in the operation and maintenance of equipment. A survey carried out by an industrial firm showed that it was economic to spend up to £200 of additional capital to save 1 h.p. of energy in a continuously running plant. As a large user of hydraulic equipment, both on the surface and underground, the mining industry should, therefore, derive valuable benefits from the activities of a research organization whose prime function is to improve the design and utilization of British plant. The extraction and piping of oil presents many technical problems, large quantities of water are handled in coal-washing plants, and all mines use hydraulic equipment, either to remove water from areas where it is not wanted or to deliver it to points where it is required. The safety of men is also bound up with research into hydro-mechanics since it may depend on the pressure with which water is delivered to fire hoses underground.

For many years the hydraulics industry was handicapped by the lack of machinery for a collective approach to technical problems. After the war, manufacturers had to compete in world markets and recognizing the importance of collective research, they formed the British Hydromechanics Research Association, which was legally incorporated on September 20, 1947, as a company limited by guarantee. At its first meeting, Sir John Anderson was unanimously elected President.

Due to the limited funds available initially, it was decided to concentrate first of all on the development of an information and abstract service of immediate use to members. It soon became evident, however, that the association required a laboratory of its own where the practical problems of members could be studied. A specially built standard factory, suitably modified for the association's needs, has, therefore, been leased at Harlow, Essex.

NEW LABORATORIES OPENED

On May 24, 1951, the new premises at Harlow were opened by Sir John Anderson. The main laboratory occupies the greater part of a rectangular area 72 ft. x 120 ft., vertical space for experimental work requiring suction lifts, etc., being provided by a gallery at a height of over 12 ft. above ground floor level. Features of the permanent equipment include a general water supply and metering system and an experimental sump for investigation of the flow in pump suction sumps and inlet pipes. Test rigs will eventually be provided for centrifugal, axial-flow and vertical type pumps. There is also an oil laboratory which, when fully equipped, will have a general oil supply and metering system, an oil pump test rig, testing machines for rotary seals and gland packings, and an experimental reciprocating pump for investigations of valve performance. A two-storey office block houses photographic and instrument laboratories.

A certain amount of practical research work had previously been inaugurated in universities, technical colleges and members' works. This work is of considerable importance to the mining industry and will be greatly facilitated by the acquisition of the laboratories at Harlow.

Whenever the rate of flow in a pipe system is altered, a transient surge pressure is propagated along the network at the velocity of sound and is reflected either positively or negatively at all discontinuities in the pipework. Severe damage may be caused by the dangerously high or low pressures sometimes set up. Although the principles of the

phenomenon are well established, the mathematical calculation is too complex in many practical cases and graphical or analogy methods have to be used. In order to obtain practical confirmation of the reliability of such methods, several investigations have been started. Preliminary tests on surge transmission have been carried out with the co-operation of the London Metropolitan Water Board on a 42 in. pumped water main 18 miles long from Hampton to Nunhead. The Association is also co-operating in experiments at Battersea Polytechnic for developing a method for making model tests on complicated pipe systems. Owing to the very high frequencies associated with the short lengths of pipe involved, electronic instrumentation has been employed.

Borehole pumps are frequently started with empty delivery pipes, and heavy surges may result when the advancing water column is arrested by a partially open valve. Tests have been carried out on a borehole pump fitted with a 4 in. 60 ft. rising main. Orifices of varying diameter were fitted at the top end of the pipe and the resulting pressure surges were measured with an electronic recorder.

Surge transmission in flexible pipes is also being studied. A graphical calculation shows that the presence of a flexible pipe in the circuit does not always reduce surge pressure as much as is sometimes assumed. In collaboration with an oil company, full-scale tests are to be carried out shortly to test this point.

EXPERIMENTS ON VORTEX FORMATION

The formation of vortices in a suction sump is a source of periodic troubles in mines. Considerable cost is therefore incurred in making sumps large enough and deep enough to prevent vortex formation and entrainment of air into the pump inlet. Since the influences of the various factors involved are not known, model tests are being made to determine the cheapest methods of construction. Tests on a fairly large rig have already shown that the entrainment of 4 per cent of air can reduce water delivery by 40 per cent and efficiency by 15 per cent, depending on the type of pump. The evidence so far obtained from the experiments indicates that a material reduction in submergence required to prevent vortex formation is possible with the bellmouth close to the sump wall, the saving in excavation required for the sump being up to 50 per cent.

The normal accuracy of commercial flow meters is sometimes vitiated by the presence of pulsations in the flow which occurs, for example, in the delivery of reciprocating pumps. Little information is available regarding this effect and the Association has started experimental work, both to determine the true discharge coefficients of orifice or venturi type meters under rapidly varying flow, and also to study the behaviour of the manometer under conditions of varying differential and absolute pressures.

Reciprocating pumps have the advantage of being able to maintain high efficiencies over a wide range of heads. Their cost would be reduced if they could work at a higher speed, but this possibility is limited by the behaviour of the valves, which become noisy and cause severe vibration with loss of efficiency and capacity at higher speeds. This is particularly noticeable in the case of self-acting suction valves. An experimental pump is therefore being constructed in which the dynamic behaviour of these valves will be studied.

Another factor limiting the speeds at which many hydraulic machines could be run is the onset of cavitation, caused by the low absolute pressures resulting from the high fluid velocities. The presence of cavitation can reduce the efficiency and output of the machine, and the rapid formation and collapse of the bubbles may cause serious erosion. The physical nature of the phenomenon has yet to be conclusively established, some theories being based on the mechanical forces arising from the collapsing bubbles and others on the electro-chemical effects associated with the tensile fracture of liquid molecules.

An investigation of the fundamentals of cavitation has been started on behalf of the association by Mark Laboratories, Keston. The theory under examination is based largely on an apparent similarity between cavitation-erosion and corrosion-fatigue, the suggestion being that in the initial stages of cavitation in water the metal is being corroded, and that only after the surface layer has been weakened will the full cavitation-erosion rate take place. By means of a magnetostriction apparatus, developed for the purpose, specimens are dipped in water and subjected to accelerations of about 10,000 g., which are sufficient to cause severe cavitation. The corrosion and erosion products are then measured. The discovery of some correlation between cavitation-erosion and corrosion-fatigue might well lead to the development of new methods or materials designed to withstand cavitation attack.

PREVENTION OF LEAKAGE

Another series of investigations concerns the prevention of leakage between moving parts. Machinery tends to become more compact and more efficient, so that the space taken up by the sealing device and the power that it absorbs are becoming relatively more important. In many cases the sealing problem is one of lubrication, since leakage can only be prevented at the cost of poor lubrication of the sliding faces with probable overheating. Test rigs have been built for examining both modifications to existing seals and promising new designs. Preliminary experiments on stuffing-box glands have shown that the power absorbed and the amount of leakage are interdependent and are influenced by the tightness of the gland. Some tests on rubber lip-seals have revealed that after modification these seals can accommodate large amounts of whip and misalignment in the shaft. In one test a 2 in. shaft whipping by 0.25 in. or out of line by 10° was completely sealed up to speeds of 3,000 r.p.m. for several minutes. Parallel with these experiments on actual seals, the association has been studying the fundamentals of friction and lubrication of seals, mainly with reference to rubber and similar elastically deformable materials.

Among other problems under investigation is the estimation of pipe friction losses, which are of economic importance not only because of the cost of the pipe, but also because an inaccurate estimate may result in pumps or other components operating away from their designed duty with a consequent loss of efficiency. Though friction formulae for particular classes of pipe may be sufficiently near for general use, there remains the problems of measuring the roughness of unspecified pipes. It has not so far proved possible to correlate the hydraulic roughness with any form of mechanical roughness measurement, so that friction loss measurements must be made on actual pipe lines, which may not be practicable. The Association is, therefore, examining the possibility of devising a simpler means of measuring hydraulic roughness.

In a sellers' market, the improvements in plant performance that follow from research and development mainly benefit the user. Though the Association is still very young, it has existed long enough to show that it can give valuable service to the users as well as the manufacturers of hydraulic equipment.

Controlling Sintered Iron-Copper Compacts

Copper powder is a popular additive to iron powder in the production of iron base porous bearings and moulded machine parts produced by powder metallurgy. Sintering is usually done above the melting point of copper, so that it occurs in the presence of a liquid phase. Sufficient diffusion of copper occurs to materially strengthen the iron powder compact. However, there is more difficulty in controlling dimensions of sintered iron-copper compacts as compared to pure iron. Most iron powders mixed with copper, pressed and sintered, show excessive growth. A few show excessive shrinkage. None remain constant.

The experiments described in a paper by Messrs. J. F. Kuzmick, President of Welded Carbide Tool Co., Clifton, N.J., and E. N. Mazza, Metallurgist, Ekstrand & Tholand, Inc., Carlstadt, N.J. (*Journal of Metals*, October, 1950), were made primarily on Swedish sponge iron powder produced from magnetite. A series of specimens produced with additions in a range of 1 to 10 per cent copper showed maximum strength between 7 and 10 per cent. However, maximum growth also occurred in this range. A series of 93 per cent iron—7 per cent copper specimens sintered over a range of temperatures showed that maximum growth occurred at about 1,150°C. Increasing sintering time decreased growth, indicating that maximum growth occurred early in the sintering cycle.

Many experiments were performed with various additives in an attempt to decrease the excessive growth. Additions of graphite up to 1 per cent cut down growth from 2 per cent to 0.3 to 0.5 per cent, a more reasonable figure. The graphite simultaneously carburized the compact, increasing its hardness and strength. Such iron-copper-graphite mixtures have come into popular use for wear resistant parts which do not have to be sized to close dimensions. Subsequently, it was found that the addition of a small amount of cast iron powder to the iron-copper-graphite mixture further cut growth and increased hardness and strength.

INVESTIGATING GROWTH

Since the carbon additives resulted in parts too hard for sizing, an investigation was made to determine the cause of growth. An iron powder produced from mill scale, which showed shrinkage with copper, was examined microscopically and found to have a more porous surface than the Swedish powder. A powder produced from de-carburized steam atomized cast iron had the least porous surface. Compacts containing 10 per cent copper were produced under identical conditions from the three powders and showed 0.5 per cent shrinkage, 2 per cent growth and 2.8 per cent growth, respectively.

To prove this theory, the iron powder with the most porous surface was annealed at 2,000°F. until sufficient sintering had occurred to cause some sealing of the surfaces. The sinter cake was reground to powder. The annealed powder showed 0.6 per cent expansion with copper against 0.5 per cent shrinkage annealed. A powder was prepared in the laboratory from Swedish magnetite under conditions which resulted in porous particle surfaces. Shrinkage of about 1 per cent occurred against growth of 2 per cent for the normal material.

Finally, it was thought that the addition of an organic material to the Swedish iron-copper compacts would solve the problem. If the organic material volatilized at about the melting point of copper, it would promote new pores for copper infiltration. Various additives were tried including resins, carbon black and pitch; all helped reduce growth, but the best results were obtained with powdered coal tar pitch.

Machinery & Equipment

The Newton Chambers Model 304 Excavator

The Model 304 excavator manufactured by Newton Chambers & Co., Ltd., Thornclyffe, near Sheffield, is claimed to have proved itself to be earning substantial profits for both the large and small contractor in mining, quarrying and industrial operations. Its high output, speed and resistance to operating conditions make it an ideal excavator for all types of hard work.

The main features of the design of the Model 304 are: ample power; practical line speeds; use of welded construction and alloy steels to reduce weight and obtain maximum strength; anti-friction bearings and totally enclosed gearings and positive steering on any radius. The full vision cab contributes to the efficiency of operations by allowing unrestricted view of the bucket through the complete digging and dumping cycle. Splinterless glass windows are fitted for protection.

Condensed specifications are:

Crawlers: The crawler assembly is of robust construction, 21 in. wide shoes and 110 in. x 94 in., sub-frames are standard; 24 in. and 30 in. shoes, also longer and wider sub-frames are available for special applications. Weight is evenly distributed along the entire length of the crawler frames by the use of guide rollers. Self-cleaning type shoes, having full width multiple hinged joints, provide great tractive power and large bearing surface. Shoes, idler rollers and drive sprockets are free from dirt collecting pockets.

Traction Brakes: Two powerful traction brakes, one for each crawler, enable the machine to work safely on grades and prevent movement of the machine towards drag bucket or away from shovel dipper. They are provided with a safety feature which permits the brakes to be applied without disengaging the steering jaw clutches.

Power Units: A 6 cylinder, 66 b.h.p. Diesel engine with starting equipment is fitted as standard, fully equipped with efficient oil, fuel and air filters. Cooling system is thermostatically controlled.



The Newton Chambers Model 304 Excavator

Transmission: Transmission between the engine and swing and traction shaft is by means of a multi-strand roller chain drive running in an oil bath gear case.

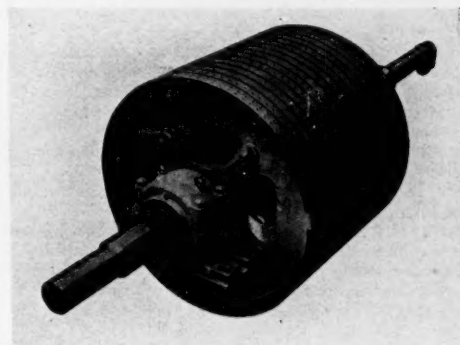
Shafts: The lower traction, swing and traction, boom hoists and crowd and the main drum shaft are all of large diameter, made from heat treated alloy steel.

Attachments: Available for face shovel, dragshovel, dragline, crane and grab crane operation. Conversion from one attachment to another can be quickly and easily effected. Face shovel and dragshovel booms are of rolled steel, electrically welded. Dipper sticks on face shovel are

double box type which straddle the boom, providing extreme rigidity and strength. Crowding mechanism is operated by chain and is thereby positive. Dipper trip is power operated. The lattice booms are 35 ft. long in 2 pieces and boom inserts of 5 ft., 10 ft. and 15 ft. are available for extending the length as desired.

World's Largest Diameter Magnetic Pulley

Manufacture of what is claimed to be the world's largest diameter electro-magnetic pulley, to be shipped to the Belgian Congo, has recently been completed by Rapid Magnetic Machines Ltd., Lombard Street, Birmingham 12. The equipment is to be installed as the terminal head



The world's largest diameter electro-magnetic pulley made by Rapid Magnetic Machines, Ltd.

pulley of a main conveyor system running at half mile centres and travelling at 256 ft. per minute, handling 700 to 800 tons of tin ore per hour.

Weighing 12 tons, this 59 in. dia. x 52 in. wide pulley will extract "tramp iron" in the form of picks, shovels, cutter teeth and short lengths of mine railway line, from the ore prior to crushing. It is mounted on two main, and two auxiliary roller bearing plummer blocks, the shaft being 16 ft. long by 8½ in. dia. Containing over 3,000 lb. of asbestos insulated copper wire, the magnet consumes 6.25 kW. and is rated for continuous duty on 220 volts.

Cushioned Shot-Firing

An illustrated brochure, dealing with the results obtained by Victor Products (Wallsend) Ltd., Wallsend-on-Tyne, after five years' research on a method of cushioned shot firing (developed under the company's patents) will be of considerable interest to mining engineers. This system will not, however, be marketed by the company in Great Britain in view of the fact that it does not comply with the Mines Department Regulations, insofar as the new Regulations necessitate the use of a clay plug at the bottom of each hole, making the "Victor" proposal inoperative. Nevertheless, it is felt that there would be widespread interest in the results obtained, and the large amount of information, dealing with shot firing in general, collected in the course of research work may be useful.

The results obtained would, according to the company, have added some millions of pounds value to the coal mines in this country; moreover, they suggest that, if an all-round co-operation could be obtained between fillers and deputies (as the company was able to establish under research conditions), then at least part, but certainly not all, of the results, could be made available without the use of the "Victor" cushion.

Metals, Minerals and Alloys

The Government has now decided to introduce full allocation schemes for iron and steel (other than steel sheet and tinplate which are already allocated), and for copper and zinc and their alloys. As, however, it will take some months to work out and introduce these detailed controls, temporary priority schemes are to be introduced within the next week or so to bridge the gap. In the first place, metal supplies required for the defence programme are to be safeguarded by attaching a D.O. (Defence Order) symbol and reference number to relevant contracts and metal suppliers will be instructed to set aside a portion of their stocks to meet orders either from main or sub contractors who carry this priority symbol.

Beyond this, steps are being taken to safeguard certain categories of civilian production, including dollar and sterling exports and the fuel and power programmes. Not more than 7 per cent of total available supplies will be earmarked for this purpose. This will be allocated among the Departments concerned who will in turn assign material priorities to selected contracts by granting them P.T. (Preferential Treatment) symbols which suppliers will also be asked to honour.

The P.T. scheme is only intended to apply to a very few items of civilian production of particular urgency or difficulty, and beyond this, manufacturers will be expected to continue to exercise their discretion in the light of the general guidance already given by the Government.

Copper.—News regarding the strike situation in Chile is confusing; reports earlier in the week said the strike had become general, and had extended to the smelting and nitrate works with an estimate of some 60,000 men on strike. It is also stated that power has failed at Chuquimata. Later, cables stated that the 10-day strike had ended but that the men's leaders were continuing their demand for higher pay. Already American imports of copper and zinc are said to have fallen off considerably, as a result of the effect of ceiling prices in the U.S. being below world export prices. The International Materials Conference has recommended general allocations of copper from the beginning of the fourth quarter in view of the fact that recent requirements far exceeded production, and it is stated in official quarters in Washington that the U.S. will allocate copper supplies to foreign and domestic users for all purposes for the fourth quarter of the year. For the third quarter just beginning it is proposed to place under complete allocation all copper materials for the brass and wire mills, foundries and miscellaneous users. The advisory committee on the copper industry expect the current shortage to continue at least for the rest of the year, and recommend an increase in the domestic copper price so as to enable the U.S. to compete for foreign copper and for future imports. There are, however, many cross-currents at work, a leading instance of which is the introduction of a new control bill, carrying approval of the Senate Banking Committee, to bar the rollback on copper and other scrap, after the expiry of the present act at the end of this month. The passage of such an amendment to the existing situation would, according to Mr. Disalle disrupt the entire stabilization programme.

Lead.—The United States' lead supplies have become critically short, and the metal is to be brought under complete allocation. Some consumers have been advised by their suppliers that they will receive no July lead. Mexican lead prices continue to stiffen as more United States buyers have to turn to the Mexican lead, the price of

which is quoted as 21½/22½c. f.a.s. Gulf Ports, with an additional 10 per cent for sterling payments as against the U.S. ceiling of 17c. In Canada, primary and refined secondary lead, as well as slab zinc and cadmium will be rationed on July 1.

U.K. imports in May were 15,619 tons—principally from Australia and Canada, as compared with 6,284 tons in April.

Tin.—Malayan output in May was 4,836 tons compared with 4,728 tons in April. This makes the Confederation's output for the first five months of the year 23,359 tons compared with 24,206 in 1950, a decline of 847 tons. With the much lower prices now prevailing, it does not look as if the fall in production will be arrested. The Congo output in May was 1,442 tons making 5,506 tons for the first five months of this year, compared with 6,400 tons a year ago.

In our last issue the fact that the Indonesian Government had protested to the U.S. Department of State against the slashing of tin prices by the R.F.C. was mentioned. The text of this note, published in full by the *American Metal Market*, carries the war into the enemies' country, pointing out that prices ever since 1947 have been consistently below the increases in the general price index in the U.S. Bureau of Labour Statistics, and that the American taxpayer, instead of being "gouged," has profited by almost \$100,000,000 at the expense of the tin producers. Of more immediate importance, however, is the statement that the price increases have been necessary to meet greatly increased costs of production. In Indonesia the living costs are said to have advanced by some 1,500 per cent and the wage index by no more than 800 per cent, and that production cannot be continued at reduced prices without profit, while strikes would be threatened through labour demands for higher wages to meet the increased cost of living. The note also points out that the attempt by American officials drastically to reduce the earnings from raw material is wholly inconsistent with the declared policy of the President, and constitutes an economic form of colonial exploitation. The Note also categorically denies Mr. Symington's statements of the existence of a world tin cartel which had "murdered the U.S. on prices, until the U.S. took counteraction," and somewhat sarcastically observes that "the only existing international organization relating to tin, is the Tin Study Group, which includes the U.S.A." All proceeds from tin sales, apart from a small minority interest are paid direct into the Indonesian Government Treasury. Indonesian exports to end of May this year were 12,679 tons against 12,079 to end of May, 1950.

U.K. imports of tin in May were 597 tons compared with 856 tons in April; imports of concentrates were 3,158 tons compared with 1,219 tons in April; Bolivia sent 1,143 tons and Nigeria 1,076 tons.

Zinc.—Supplies in the United States are still tight, but are said to show signs of relaxation, as the result of civilian usage restrictions. Mexican zinc has been selling at a shade over 30c. per lb. f.a.s. Gulf to European and American consumers. The American grey market is apparently still operative and 35c. is said to have been paid for prime western and 45/50c. for special grade. A new reduction plant is being completed in Italy at Gorno in the province of Bergamo, which should come into commission next year, and give Italy the producing capacity of some 70,000 tonnes annually, about half of which should be available for export. However, production costs are said to be appreciably higher than elsewhere, as the grade of ore available is low, as is the skill of the miners. This year the output is expected to be between 45,000 and 48,000 tonnes of slab.

U.K. imports of zinc in May were 7,513 tons, to which Canada Australia and U.S.A. were the principal contributors. The April imports were 6,737 tons. Imports of concentrates were 16,856 tons compared with 5,075 tons in April.

Aluminium.—The Norwegian Government has made public, plans for the construction of a new aluminium plant at Sunndalsora in west Norway. The projected capacity is 40,000 tonnes annually, which will practically double the Norwegian production, but construction may take from four to five years. When completed, the new works should give employment to 800/900 workers. Capital cost is estimated at £12,500,000 on the basis of recent prices but a further £5,000,000 would be necessary to increase the power supply from the Aura hydroelectric plant. Realization of the plans depends on E.C.A. funds being made available for the purchase of machinery and equipment, to be repaid in exports of aluminium.

It is reported from Japan that Alcoa is sending representatives to Japan to negotiate a tie-up between United States and Japanese aluminium interests, which presumably is outside the limits laid down by the United States Supreme Court in recent anti-Trust suits. Japanese production this year may reach 36,000 tonnes.

U.K. imports of aluminium in May were 12,427 tons compared with 13,506 tons in April. Bauxite imports were 26,614 tons compared with 16,900 tons in April.

Cadmium.—U.K. imports of cadmium in May were 206,330 lb. compared with 103,697 lb. in April. Imports for the four months are well ahead of those for the same period last year which, in their turn exceeded the first four months of 1949.

Manganese.—U.K. imports of manganese ore in May were 37,688 tons principally from the Gold Coast, as compared with 27,102 tons in April. The French Price Control office has raised its quotation from Frs.295 per unit to Frs.320.

Sulphur.—U.K. imports in May were 58,790 tons as compared with 27,121 tons in April. As usual the United States were responsible for almost the whole amount. Production in the United States is rising and for the first four months of the year totalled 1,734,434 tons against 1,579,904 tons in the same period last year. Pyrites imports into the U.K. were 29,414 tons in May, against 23,189 tons in April.

Lord Bessborough, at the Rio Tinto meeting on Monday expressed the opinion that there was every reason to anticipate a period of long continued prosperity for all the pyrites trade.

Titanium.—A company has been organized at Princetown, N.J., to investigate a process for producing titanium metal. The interests involved are Horizons Inc., and the Ferro Corporation who have acquired a minority interest in the new company Horizons Titanium Corporation. The new process is a continuous one and will, it is claimed, prove cheaper than the Kroll process now most usually employed. A pilot plant is to be constructed. Current prices for titanium are reported at \$5 per lb. for sponge and \$7 for ingot. Titanium output in the U.S. last year is reported as 550,000 lb. The Monsanto Chemical Co. in conjunction with the National Research Co. of Cambridge, Mass., is studying to develop improved processes for producing titanium.

U.K. imports of ilmenite in May were 13,243 tons against 4,497 tons in April.

Tungsten.—On Monday last the price of ferro and powder advanced a further 6d. per lb. to 35s. 6d. and 37s. 6d. respectively. The trend of the wolfram market in this country has been very uncertain and we should call the price around 575/585s. per unit. There has been a great deal more stuff on offer, but this of course does not mean greater production, but activity by speculators en-

deavouring to unload their stocks at present levels fearing that co-ordination between American and British purchasing authorities may have the effect of lowering the level of prices. It is rumoured that the British Government, through the Ministry of Supply, and the American Purchasing Agency are endeavouring to come to some arrangements to prevent them buying against each other. Our Portuguese correspondent's comments on the situation there appear in another column.

Gold.—Mr. R. B. Hagart, presiding at the Transvaal Chamber of Mines annual meeting said that since July last the industry had been selling the maximum quantity of gold for "industrial purposes" permitted by the S.A. Treasury; during the first five months of this year 2,000,000 oz. had been sold through Government channels which secured a premium of £3,427,000, and through unofficial channels some 500,000 oz. The total Transvaal output in the five months was 4,729,345 f.oz.

The London Metal Market

(From Our Metal Exchange Correspondent)

Activity on the market has remained at a reasonable level although it is apparent that the price has entered once more into a period of small fluctuations. This price range is likely to continue until the policy of the American authorities becomes settled and the next indication of their intentions should be given almost at once when it becomes known whether they have invoked the \$1.03 clause in the contracts with the Belgians, Dutch and Indonesians.

From statements made by American administrators, combined with the rumours about terms offered to the Bolivians for the next contract, it appears that the fall in the price has given rise to the hope that a maximum price of \$1.03 could be established generally with the Bolivian contract based on a price somewhere between that figure and the 76.87c. per lb. quotation which ruled at the time of the outbreak of the Korean war. Such a price level would doubtless lead to renewed protests by the producing countries, and possibly to a reduction in output thus making the retention of such a price level impossible in the long run.

On Thursday the official close on the tin market was: Settlement price £930, Cash Buyers £930, Sellers £935; Three months' Buyers £877 10s., Sellers £880. In the afternoon the market was irregular. Turnover for the day was 230 tons. Approximate turnover for the week was 970 tons.

The Eastern price on Thursday morning was equivalent to £925 5s. per ton, c.i.f. Europe.

Iron and Steel

The steel industry appears to be on the brink of far reaching extensions of Governmental controls. Details of a steel licensing scheme approved by the Cabinet are to be announced by Mr. Hugh Gaitskill, Chancellor of the Exchequer, this week, and may also be accompanied by an authorization for an increase in prices to cover the steep increases in the cost of production since the last advance in prices in February last. The Minister of Supply has however, made it plain that he is still opposed to any rise in scrap prices, in spite of the recommendation of the Select Committee on Estimates that these prices should also be reviewed.

With this pronouncement by Mr. Strauss, the scrap merchants violently disagree. They point out that apart from minor adjustments to cover advances in rail charges, the price of scrap is still at pre-war levels and that some allowance should be made in their increased cost of materials and labour. Finally, a squabble between the Iron & Steel Corporation and the British Iron & Steel

Federation has been publicly ventilated. The Corporation has requested the Federation to transfer the two subsidiaries enjoyed in the acquisition of raw materials for the industry. With this request the Federation has refused to comply on the ground that they are operating for privately owned as well as nationalized companies, and this dispute is still unresolved. The Government has no authority under the Iron & Steel Industry Act to nationalize these subsidiaries and to do so special legislation might be necessary.

Meanwhile, the flow of raw materials to the producing plants is quickening. Imports of foreign ore last month were the heaviest this year, but over the five months there is still a deficiency of over 500,000 tons as compared with the corresponding period of 1950. Moreover, stocks have been even down to danger level and a much more pronounced acceleration of shipments will be necessary before iron and steel production can be raised to the proportions required by the steel consuming companies. Even the U.S.A. with its colossal output of steel has been compelled to resort to a system of steel allocation, and the British Minister of Supply is hoping to obtain from that source an increased allocation of sheet steel for the motor industry. Pig iron is also in short supply with consequent embarrassments for the foundry trade: in fact some establishments indicate that owing to the shortage they may be compelled to resort to a four day working week.

Coal

The Ministry of Fuel and Power reports the output of coal for the week ended June 23 as 4,225,000 tons, compared with 4,282,500 tons in the previous week. The statistical statement of the N.C.B. for the first quarter of 1951 shows a surplus of £983,100, an increase over that for the last quarter of 1950 (£693,204), but much less than in the first quarter of 1950 (£5,600,011). Output was 53,323,361 tons, 743,737 tons higher than in the first quarter of 1950. Production costs increased by 9.7d. per ton as compared with the last quarter of 1950. There was a heavy loss on imported coal of £3,500,000.

JUNE 28 PRICES

COPPER			
Electrolytic...	...	...	£234 0 0 d/d
TIN			
(See Metal Notes above for Thursday's Metal Exchange prices)			
LEAD			
Soft foreign, duty paid	...	...	£160 0 0 d/d
Soft empire, including secondary lead	...	...	£160 0 0 d/d
English lead	...	...	£161 10 0 d/d
ZINC			
G.O.B. spelter, foreign, duty paid	...	...	£160 0 0 d/d
G.O.B. spelter, domestic	...	...	£160 0 0 d/d
Electrolytic and refined zinc	...	...	£164 0 0 d/d

ANTIMONY	
English (99%) delivered,	
10 cwt. and over ...	£390 per ton
Crude, (70%)	£305 per ton
NICKEL	
99.5% (home trade)...	£454 per ton
OTHER METALS	
Aluminium, £124 per ton.	Palladium (scrap), £8 oz.
Bismuth, 22s. 6d. lb.	Platinum, £27/£33 5s. nom.
Cadmium, 18s. 3d. lb.	Rhodium, £45 oz.
Chromium, 5s. 3d. lb.	Ruthenium, £30 oz.
Cobalt, 15s. 6d. lb.	Quicksilver, £73 10s./£74
Gold, 248s. f.o.z.	ex-warehouse.
Iridium, £65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 1s. 6d. - 2s. lb.	Silver (bar), 76½d. f.o.z. spot
according to quantity.	and forward.
Osmiridium, £35 oz. nom.	Tellurium, 19s. lb.
Osmium, £70 oz. nom.	
Palladium, £8 10s. oz.	
ORES, ALLOYS, ETC.	
Bismuth ...	65% 15s. 9d. lb. c.i.f.
	60% 15s.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£11 per ton c.i.f.
" " (concentrates)	£11 per ton c.i.f.
" " Refractory	£10 12s. per ton c.i.f.
Baluchistan Metallurgical	£11 11s. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Manganese, Best Indian	(Nominal)
Molybdenite (85% basis)	(Nominal)
Wolfram (65%), U.K.	575s./585s. c.i.f. nom.
Tungsten Metal Powder	37s. 6d. nom. per lb. (home)
(for steel manufacture)	
Ferro-tungsten	35s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots...	£30 3s. 9d. per ton
Ferro-manganese, home	£37 19s. 10d. per ton
Ferro-manganese, export	Nom.
Brass Wire	2s. 6½d.
Brass Tubes, solid drawn	2s. 0½d.

Mining Men and Matters

Mr. K. C. Acutt has been appointed a director of Anglo American Corporation of South Africa.

Mr. W. A. Odgers has been appointed a director of Mufulira Copper Mines to fill the vacancy caused by the resignation of **Mr. S. S. Taylor**.

Coal Geology Congress.—About 200 geologists from 12 countries, including Britain, are meeting in Heerlen, Holland, to organise a regular exchange of information about the geological services provided in their mining industries. The Congress, which started on June 26, is being held under the auspices of the Netherlands Geological Foundation.

The Transvaal Chamber of Mines states that at the Annual Meeting, held in Johannesburg on June 25, the following were elected to the Executive Committee for the current year: **Mr. S. R. Fleischer** (President); **Messrs. W. H. A. Lawrence** and **R. B. Hagart** (Vice-Presidents). The remainder of executive consists of: **Sir George W. Albu**, **Bart.**, **Messrs. C. B. Anderson**, **P. M. Anderson**, **B. L. Bernstein**, **W. M. Frames**, **P. S. Hammond**, **H. C. Koch**, **C. S. McLean**, **S. G. Menell**, **H. F. Oppenheimer**, **K. Richardson** and **D. A. B. Watson**.

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Company News & Views

Vaal River Finance

Provision of further capital totalling nearly £10,000,000, sufficient to bring the Stilfontein Mine to production and to establish two further mines on the Lucas block immediately to the south of this mine, has now been ensured. The bulk of this capital is to be found by the Anglo American Corporation and its associates.

The directors of Stilfontein Gold Mining Co. are to seek authority to increase the company's borrowing powers by a further £5,000,000 thus raising this figure to £7,500,000. They estimate that half this additional amount will suffice to bring the mine into production during the latter half of next year with an initial monthly capacity of 50,000 tons. This additional capital is to be supplied by the Anglo American Corporation and associates in the form of a 5½ per cent loan, repayable in five equal six-monthly instalments beginning in December, 1953.

The remaining £2,500,000 additional borrowing powers sought are to be earmarked for loans to cover the capital cost of the proposed uranium extraction plant for treating the mine's residues. While the exact cost of this cannot yet be estimated, the sum provided is expected to leave a margin for contingencies.

It will be recalled that when the company made an issue a year ago of £2,000,000 of 5½ per cent convertible unsecured loan stock 1954/60, the company's further borrowing powers were then restricted to £500,000 in excess of the loan stock outstanding at any given time. It was then the intention that the remaining capital required to bring the mine to production would eventually be raised by a rights issue to shareholders. In the event, however, the directors clearly do not feel that such an issue could be carried through on satisfactory terms in the present state of the market, hence the additional borrowing powers.

In return for their agreement to the increased borrowing powers, the loan stockholders are to be offered some improvement in their conversion rights to the extent that the first option will now provide for conversion of 25 per cent of the stockholding into Ordinary shares at 27s. 9d. per share instead of 31s. 3d., while the second option to convert a further 25 per cent is to be at 38s. 6d. instead of at 45s. 6d.

It is also announced that the Anglo American Corporation and associates are to subscribe a substantial proportion of the capital required to establish at anyrate one, and more probably two, new mines immediately to the south of Stilfontein in which the Anglo-Transvaal Consolidated, both directly and through Middle Wits, and also the Strathmore group are interested. Each mine is to have an initial capital of 4,000,000 5s. shares of which 1,800,000 shares will be subscribed by the Anglo-Transvaal and Strathmore groups and their subsidiaries, 1,200,000 are to be earmarked for vendors' consideration and the remaining 1,000,000 shares will be subscribed for by the Anglo American Corporation and associates at a 3s. premium in consideration of their having agreed to make available to these new mines loans of up to £2,500,000 in respect of each company. These loans will bear 5½ per cent interest, and must be fully repaid by 1963, 50 per cent of the company's distributable profits (after providing for current capital expenditure and interest charges) being allocated for this purpose.

Any further capital required to bring these mines into production is to be raised within the next 12 months through additional share issues by the two new companies, these issues being if necessary underwritten by the Anglo American Corporation.

The first of the mines to be established will be under the management of the Anglo-Transvaal group, and the second under that of the Strathmore group.

Mountain Copper's Improved Showing

The group accounts for the year show a net profit (after tax) of £92,634, a great improvement on the figure of £5,818 recorded in 1949. This result was brought about principally by a much increased profit on sales which amounted to £222,924 (£82,420), and it is hardly surprising that taxation amounted to £53,466 against nil. The Directors recommend a dividend of 4d. plus a bonus of 2d. per stock unit representing a distribution of 25 per cent compared with 6½ per cent in 1949.

The company is principally concerned with three undertakings—the production of pyrites from the Hornet mine in Shashta County, California, the operation of a chemical and fertilizer plant at Martinez, near San Francisco, and the operation of a subsidiary company, San Francisco Chemical Co., which works a phosphate rock deposit. Sales of pyrites increased some 5 per cent on the year, and owing to the general sulphur shortage, the early months of this year have seen a further substantial increase. Sales, however, are now subject to a ceiling price. Production of copper chemicals, fertilizers, etc., increased by over 48 per cent during 1950 at the Martinez plant. Here again ceiling prices operate, but the situation is further complicated by the fact that the price of their principal raw commodity, scrap copper, has so far escaped control, and has been fetching from 25 to 40 per cent more than electrolytic. As a result of this combination of circumstances, the plant has been running at a small loss in recent months. The San Francisco Chemical Co. again recorded sales of phosphate in excess of the previous year, and persistent demand has necessitated plans to expand production by augmenting mining equipment and installing additional milling facilities. New plant is not expected to come into operation until March, 1952.

Idris Hydraulic Increases Dividend

Idris Hydraulic Tin Ltd., had a good year in 1950. Production of tin ore was at 263 tons the same as in 1949, although the yardage worked was nearly 80,000 cu. yd. down at 279,000 cu. yd., while the price realized per ton averaged £497 compared with £386 in 1949. An ominous feature was a 30 per cent increase in costs per cu. yd. which worked out at 3s. 6d. as against 2s. 4d.

Total revenue for the year amounted to £116,977 including income from sale of tin ore after payment of royalty amounting to £109,406 (£84,489 in 1949). Mining costs at £49,233 (£42,213) showed only a small increase due to the substantially higher grade of ground worked, while head office and other expenses amounted to £5,243 (£4,096) leaving a profit, before tax of £62,501 (£41,516). Taxation required £35,180 and dividends, totalling 25 per cent called for £16,500 compared with the 15 per cent distribution in the previous year. £12,500 was transferred to general reserve, which now stands at £25,000, leaving a carry forward of £5,737. In his address to shareholders on the company's report, the chairman points out that taxation including Government tin royalty took no less than 41 per cent of the company's gross revenue as compared with mining costs which only took 36 per cent.

Earlier this month it was announced by the company that a large landslide had occurred in the Batu Karang section of the property, which resulted in loss of equipment and the closing of the northern portion of the paddock. The Batu Karang section produced some 25 per cent of last year's output and production from this paddock is likely to be adversely affected for some time.

Increased Earnings by Kaduna Companies

The report and accounts for both Kaduna Syndicate and Kaduna Prospectors for 1950, which are available two months earlier than in recent years, show considerably increased earnings although, in the case of Kaduna Syndicate, output of concentrates has continued to decline.

Kaduna Syndicate reports a decrease in output at 317 tons concentrates, compared with 368 tons in 1949. Production by African tributaries at 55 tons also being down from the preceding year's figure of 76 tons. Part of the reduction in the company's output is attributed to the cut in the working hours of African labour from 48 to 44 per week, which was operative throughout the year. Revenue from tin ore sales during the year amounted to £186,840 (compared with £140,204 in 1949), which together with miscellaneous income of £3,589, yielded a total of £190,429. Against this mining charges in Nigeria amounted to £83,653 (£83,292), while transportation charges and assays totalled £6,886 (£5,276), and London charges and a small stock adjustment totalled £5,886. Expenditure on advance stripping and on prospecting totalled £7,381 (£4,718), and taxation amounted to £52,866 (£30,000), leaving a net profit of £33,757 (£29,912). A sum of £10,542 goes to general reserve and a further £26,400 to a dividend of 50 per cent less tax on a capital amount of £96,000, to which figure the issued capital was raised in March of this year from £48,000 by a one for one bonus share issue.

Kaduna Prospectors produced the same amount of concentrates as in the preceding year, namely, 84 tons, although the revenue from sales of concentrates rose from £34,170 in 1949 to £48,574 in 1950. Other income during the year amounted to £699. Against this, mining charges in Nigeria totalled £24,538 (£22,148), transportation charges and assays required £1,722 (£1,203), while London charges and stock adjustments amounted to £2,967. Taxation amounted to £11,956 (£5,400), leaving a net profit of £8,090 (£4,397). The general reserve was increased by £3,033 and the payment of a dividend of 33½ per cent (20 per cent) on the increased capital of £30,000 required £5,500. The carry forward amounted to £3,125. The capital increase which occurred in March of this year, increased the company's issued capital from £12,000 to £30,000 by a two for three bonus share issue.

In the chairman's reviews accompanying the reports and accounts of the two companies, Sir Godfrey Fell states that any question of returning surplus capital to shareholders has been rendered impracticable by the recent legislation which would impose 50 per cent profits tax on any such distribution. The examination of new areas in the valley of the Niger river is being continued and he states that the directors expect shortly to come to a final decision in the matter and will notify shareholders as soon as possible.

Company Shorts

Johnson Matthey to Make Rights Offer.—Johnson Matthey & Co. propose in the near future to make an issue of Ordinary shares in order to finance current requirements and further development. The offer is expected to be made to Ordinary shareholders and loan stockholders for cash in the form of renounceable letters of rights. Further details will be sent to holders as soon as possible.

Tehidy Minerals Pay 15 Per Cent.—During the year 1950, gross revenue of Tehidy Minerals amounted to £16,979 against £12,400. The better earnings, the directors point out, were due to the increased amount received from both minerals dues and the company's investments in Malayan tin companies. Net profit after providing £7,954 in taxation, was £6,320, against £4,676 previously. The sum of £5,788 was absorbed to meet the dividend distribution, which was stepped up to 15 per cent (10 per cent), leaving the forward balance slightly higher at £13,747 compared with £13,053 previously.

The book value of the company's investments was recorded

in the balance sheet at £74,347 (same), having a market value at the fiscal year-end of £71,749.

Climax Rock Drill's Increased Turnover.—In the year to December last the Climax Rock Drill and Engineering Works Ltd. had a turnover of about 20 per cent in excess of the 1949 figure. The net profit, however, at £40,825 only showed an increase of £3,505, reflecting increased costs of production and servicing which were not offset by increases in the sales price of the company's products in what is a fairly competitive market. Since the end of the year the company has issued £300,000 of 4½ per cent debenture stock (1970/80), and at the same time has increased its issued capital from £180,000 to £300,000 by a rights issue to shareholders of the unissued 80,000 ordinary 5s. shares and by a subsequent one-for-two bonus issue. The dividend distribution on the profits for the year totalled £10,200 (£9,900 in 1949), made up of an interim dividend of 5 per cent on the pre-issue share capital plus a final distribution of 3½ per cent on the increased capital of £300,000.

In his statement accompanying the report and accounts, the chairman, Mr. Ralph Ewing indicates that the company's order book continues to be well filled and that the company's exports, more particularly within the Empire, are unlikely to be unduly affected by the rearmament programme.

Topical News in Brief

Cyprus Mineral Exports, March.—Iron pyrites, 47,467 tons; cupreous pyrites, 6,265 tons; cupreous concentrates, 580 tons; cement copper, 101 tons; chromite, 570 tons; umber, 1,228 tons; asbestos, 131 tons; gypsum, 50 tons.

Higher Israel Diamond Exports in 1950.—Exports of diamonds from Israel in 1950 amounted to \$10,500,000, against \$5,900,000 in 1949. Approximately 90 per cent of the shipments went to the United States.

Metals Famine in East Germany.—According to the *Industrie Kurier* of Düsseldorf, the Soviet Union has had to increase deliveries of raw materials to East Germany as a result of stricter Allied control of West German exports. Steel, non-ferrous metals and tinplate are said to be particularly short.

Northern Rhodesia Mineral Production in February.—During February, Northern Rhodesia produced the following minerals: gold, 60.8 f.o.z.; cobalt alloy (37.72 per cent Co.), 2,674 cwt.; copper (blister), 13,014 tons; copper (electrolytic), 8,448 tons; lead, 1,050 tons; tin concentrates (70 per cent Sn.), 0.07 ton; zinc, 1,740 tons; limestone, 8,892 tons; mica (sheet), 459 lb.

Power From Volcanic Energy.—It is reported from St. Lucia, W.I., that a United Nation's expert is to investigate the possibility of producing electricity in the island based on surface evidence of volcanic energy. Presumably this is in line with the successful operation of the Italian *soffioni* at Lardorello described in *The Mining Journal* of May 18.

S. African Mineral Output for First Quarter 1951.—Gold, 2,797,437 f.o.z.; silver, 284,198 f.o.z.; diamonds, not available; coal, 3,348,163 s.tons; copper, 9,697 s.tons; copper in matte and concentrates 238 s.tons; tin, 276 s.tons; platinum (concentrates), 751 s.tons; platinum (crude), 68,047 oz.; asbestos, 20,966 s.tons; chromite, 144,086 s.tons; manganese, 194,164 s.tons; lead, 234 s.tons.

Canada's Mineral Production, 1950.—Canada's mineral production rose to a new peak value of \$1,040,887,600 in 1950, exceeding by 15 per cent the previous high of \$901,110,000 in 1949, according to the preliminary annual report of the industry for the year just released by the Bureau of Statistics. Ontario accounted for 34.9 per cent of the total, a slight decline from the preceding year's proportion of 35.9 per cent. Quebec's output accounted for 20.9 per cent of the total, up from 18.3 per cent in 1949, but British Columbia's proportion was down from 15.1 per cent to 13.6. Alberta's percentage rose slightly from 12.6 to 12.9. The remaining provinces and territories accounted for 17.7 per cent of total mineral production as against 18.1 in the preceding year.

British Team to Study U.S. Materials Conservation.—Eight representatives of British industry, left for the U.S. recently to study materials conservation under the auspices of the Technical Assistance Programme of E.C.A., and the Anglo-American Council on Productivity. The visitors are principally interested in U.S. methods for conserving certain scarce metals; recovery of wastes and use of substitutes. Specific fields of inquiry include methods of using substitutes for scarce ferrous, non-ferrous and light metals, metal alloys and alloying materials; emergency specifications and standards; scrap recovery and salvaging of rejects; alterations in design (such as using plastic mouldings in place of metal die castings); simplification of product range; factory re-organization, and co-operative measures between supplier and user.

RIO TINTO COMPANY

RESULTS AFFECTED BY EXCHANGE RATES KEEN DEMAND FOR PYRITES DIFFICULT CURRENCY SITUATION THE EARL OF BESSBOROUGH'S REVIEW

The Seventy-Eighth Annual General Meeting of the Rio Tinto Company, Ltd., was held on June 22 at Winchester House, Old Broad-street, London, E.C. The Rt. Hon. The Earl of Bessborough, G.C.M.G. (the chairman), presided.

Mr. H. A. Mellor (London Manager and secretary) read the notice convening the meeting and the report of the auditors.

The Chairman said: Gentlemen,—With your agreement I propose to take the report and accounts as read. (Agreed).

Revenue Account.—There was a most gratifying increase in net investment income in 1950 which at £359,913 compares with £276,480 for 1949. After setting off the trading loss of £145,910 brought down from the profit and loss account, the profit carried to appropriation account was £228,182, against £395,695 for 1949.

TRADING RESULTS OF THE YEAR

I very much regret that the trading results are not more satisfactory. I think the report explains the main reason for this. We received 49 pesetas for each pound sterling we had to remit to Spain, yet for the pounds sterling or other currencies which we are allowed to remit from Spain in order to purchase equipment and to pay our working expenses outside Spain, we have to pay 90 pesetas to the pound if the remittance is for the purchase of railway material and the "free" rate of 110 pesetas to the pound for remittances for mining machinery, working expenses, etc. The difference between the rates is, as you see, very considerable. This in itself involves a heavy reduction in our trading margins because, as our accounts are kept in sterling, the directors were of the opinion that we could not give our peseta cash balances a higher sterling value than we should have obtained had we been able to convert them into pounds. Moreover, owing to the increase during the year in the rate in pesetas which the Spanish authorities decreed had to be paid for sterling and other foreign currencies, we had similarly to write down in terms of pounds balances in pesetas brought forward from previous years. I can, however, say that the trading results in pesetas were good and had the peseta/sterling rate been the same for all purposes and had it remained constant over the year, the company's trading profit would have been very advantageous.

But it is only prudent to point out that such an assumed trading profit, although expressed in pounds, would still have remained an unrealized profit until the company had been able to remit it to this country. Even before reaching the trading profit stage there are many extremely difficult accountancy problems—for instance, are we to continue to write off depreciation if there are no working profits to meet it; and to take the point a step further, even were there working profits to meet it, should depreciation be written off sterling assets unless and until the company is in fact permitted to remit pounds to cover this item.

BALANCE-SHEET

There seems to be nothing worthy of special comment other than the item investments. The company's investments in Rhodesia were not changed over the year to any appreciable extent. You will notice, however, that the market value of quoted investments has risen from £6,999,387 at the end of 1949 to £11,414,816 at the end of 1950. The book value has also risen over the same period from £2,265,568 to £2,793,377. The latter increase reflects the acquisition of a comparatively small interest in Tanganyika Concessions, Ltd., and further expenditure on the joint venture at Kilembe, Uganda. As regards this venture, your company has in conjunction with the Frobeniser Company of Canada carried out further exploration work on the copper and cobalt deposit at Kilembe to which I made reference last year. The result to date appears to justify our preliminary view on this property and indicates the existence of substantial ore reserves which should be susceptible of commercial exploitation. But, as stated in the directors' report, it will be several months before a definite announcement can be made.

MINES IN SPAIN

Although owing to the currency situation imports and equipment, etc., were considerably restricted, production at the mines was increased and sales of pyrites totalled 822,866

tons for 1950, as compared with 704,175 tons for 1949.

The authorities in Spain early in 1951 appointed a commission, styled "Operation P," to deal with the development of the Spanish pyrites trade. The general idea would be that up to a point the pyrites trade should be a self-contained entity inside the Spanish economy. This would mean that of the sums in foreign currency accruing to the Spanish Government from the export of pyrites, the pyrites producers should be permitted to pay back a certain proportion of the purchase of plant, equipment, etc. At present the proportion is 7½ per cent. for new plant, equipment, and certain items of stores and a further 7½ per cent. in respect of former purchases for which the pyrites producers have not yet been allowed to remit the foreign currency. Your directors have every hope that this may not only result in the company being able to acquire the necessary plant and equipment to bring back the mines to a higher level of production, but that it may also ultimately enable the company, provided adequate labour is available, to return to a sound trading basis after a lean period lasting nearly 20 years.

There is a keen demand for pyrites owing partly to the widening development of the chemical trade and partly to the rather sudden reduction in exports of sulphur from the U.S.A. Provided pyrites prices do not rise to such a level as to force consumers on to more obscure and less immediate sources of sulphur, there is every reason to anticipate a period of long-continued prosperity for the pyrites trade.

In January, 1951, the mines had the honour of a visit from the Minister of Industry and Commerce, Sr. Suanzes.

I paid a visit to Spain in October, 1950, and had the honour of an audience with the Chief of the State. I also visited the mines and was very impressed by the way in which the property is being run and by the efforts being made by the staff and workmen to obtain the maximum possible production. Sir Mark Turner also visited Spain and the mines during the year under review.

ADMINISTRATION

Mr. A. T. Gough retired from the post of general manager in Spain at the end of 1950. The Board deeply appreciate the devoted service he has rendered the company during his 38 years in Spain. The nine years during which he was general manager were full of difficulties, but these he faced with an ability and steadfast loyalty to the company which are worthy of the highest praise. On April 10, 1951, Mr. Gough was appointed to a seat on the Board, and you will later be asked to confirm this appointment, as well as that of Mr. F. Byers, who was appointed on the same date. We look forward to useful collaboration from these gentlemen.

Mr. Gough's successor as general manager in Spain is Mr. C. R. Julian, who has been promoted from technical deputy-manager. Mr. Julian has been with the company 28 years and it is no exaggeration to say that his technical work at the mines has been a brilliant success.

In London, Mr. J. N. V. Duncan, formerly joint London manager, was appointed managing director from January 1, 1951, in succession to Sir Mark Turner, who remains a director and to whom the company is greatly indebted for having served temporarily as managing director up to the end of 1950.

DIVIDEND

As stated in the report, the Board recommended that the dividend on the Ordinary shares be increased from 10 per cent., free of tax, to 12½ per cent., free of tax, in view of the increased dividends from its Rhodesian investments, although owing to the loss on trading this involves a reduction in the carry-forward from £1,084,058 to £1,002,943.

TRIBUTE TO THE STAFF

In conclusion, I desire on behalf of all my colleagues on the Board and I am sure also in your name, to express our very real sense of gratitude to the whole of the staff at home and abroad, for their devotion to the interests of the company. We know that the company is admirably served and I regard it as a pleasure as well as a duty to pay this tribute.

The report and accounts were adopted and the payment of a dividend at the rate of 12½ per cent., free of tax, was approved.

The retiring directors (The Rt. Hon. The Earl of Bessborough, G.C.M.G., Monsieur Etienne du Castel, D.S.O., Mr. J. N. V. Duncan, Mr. A. T. Gough and Mr. C. F. Byers) were re-elected, and Messrs. Turquand Youngs and Co. were re-appointed auditors.

The proceedings then terminated.

SELECTION TRUST

The Eighteenth Annual General Meeting of Selection Trust, Ltd., was held on June 21, at Selection Trust Building, Mason's Avenue, London, E.C.2. The following is the abridged speech of the Chairman, **Mr. A. Chester Beatty, Jr.**

Gross revenue of Selection Trust and its subsidiaries for the year ended March 31, 1951, amounted to £1,404,000 (£933,000). Income from investments £1,052,000 was £320,000 more than the previous year, due to commencement of dividend payments by Tsumeb Corporation and larger distributions by American Metal Company and Consolidated African Selection Trust. Profit on realization of investments was also higher at £326,000 (£178,000).

After deducting expenses there was a balance of £1,319,000, taxation was £535,000. Reserves have been increased by £150,000 to investment reserve, £100,000 to general.

Final dividend of 2s. 3d. per unit of stock is recommended, which, together with the maiden interim dividend of 1s. per unit paid in January, will make a total of 3s. 3d. per unit, less tax, for the year, compared with 2s.

Reserves and unappropriated profits are over £1,200,000. Liquid resources, £2,500,000 are also higher than ever.

We have a large holding in the American Metal Company through which we are interested in Roan Antelope Copper Mines and Mufulira Copper Mines.

The American Metal Company has considerable other mining and metal interests in which we have an indirect interest. A new activity of American Metal Co. is their Southwest Potash Corporation formed to develop large potash deposits in New Mexico.

We have a valuable participation in the Tsumeb mine in South West Africa, whose results for year ended June 30, 1950, showed net profit having increased from £1,258,000 to £1,495,000. The Tsumeb Corporation paid its maiden dividend in June, 1950, and regular quarterly dividends have since been paid.

On March 29, 1951, far-reaching constitutional changes were introduced in the Gold Coast, where we have important interests through Consolidated African Selection Trust. The preliminary moves in the direction of self-government and Dominion status have taken place smoothly, and we await experience of the operation of the new system.

The year 1950 was a good one for the diamond market. Sales amounted to £50,000,000, some £22,000,000 higher than the previous year.

Principal gold interests in the Orange Free State are in St. Helena Gold Mines and Western Holdings.

St. Helena annual report announced that it does not anticipate that the reduction plant will be ready to go into commission before the second half of the year.

On Western Holdings' property, shaft sinking is progressing normally and No. 1 shaft may reach the Basal Reef Horizon at the end of the year to be followed by No. 2 shaft. Drilling south of the Vaal River is being continued.

Output from the Venezuelan business of Ultramar Company is now 23,000 barrels per day. That company's loan of £2,000,000 from the Finance Corporation for Industry was repaid by £500,000.

Our exploration work on the Ashanti Goldfields Corporation's concession was abandoned last October.

We are continually seeking new mining business and during the past year some 40 propositions of various kinds were considered.

DOMICILE

Whatever can be said about the recently proposed legislation in this country—requiring permission to be obtained for the control of companies to be transferred abroad—one thing is sure, it can only act as a deterrent to new companies searching for or finding raw materials overseas being registered in this country.

The effect of a change of residence away from this country by this company and Seltrust Investments on the taxes payable by them and by shareholders would be most complicated. Both companies receive income from a number of different overseas countries and this income is naturally taxed by the countries in which it originates. In addition, much of it is taxed again by at least one and sometimes more intermediate countries before it reaches us. Any move away from the United Kingdom would affect each item of income in different ways, some to the companies' and shareholders' advantage, and others to their detriment. On balance, your directors have come to the conclusion that, even on tax considerations alone, and clearly these are by no means the only considerations, it would be undesirable as circumstances are to-day to move this company and Seltrust Investments away from Great Britain.

The report and accounts were adopted.

MINING TRUST

INCREASED DIVIDEND

The Third Annual General Meeting of Mining Trust Ltd., was held on June 27 at Winchester House, Old Broad Street, London, E.C.

The **Rt. Hon. Earl Castle Stewart, M.C.**, Chairman of the Company, presided.

The following is an extract from the statement of the Chairman, which was circulated with the report and accounts for the year ended December 31, 1950:—

The increase over the previous year in the profits tax from £37,482 to £50,199, reflects a charge of 30 per cent on distributed profits for a full year, and also takes into account the additional 20 per cent imposed by the last Budget on the dividend increase of 1d. per share which shareholders are invited to approve.

The profit and loss account shows a gross income of £241,537 as against £247,366 for the previous year. For 1950 Mount Isa Mines paid a dividend of 15 per cent, against 25 per cent. Saudi Arabian Mining Syndicate declared dividends of 20 cents as against 45 cents received in 1949. These reductions were offset by the increased dividend of 75 per cent paid by Britannia Lead Co., and higher receipts from fees and commissions, etc. Expenses at £27,515 compare with £27,438 for the previous year, and after charging £126,664 for profits tax and income tax there remained a net profit of £87,358.

In the appropriation account the sum of £46,368 was brought forward from last year which, together with the net profit for the year gives a total of £133,726 to be appropriated. £78,041 will be required to meet the proposed dividend of 6d. per share, less income tax, and the carry-forward will be increased by £7,830 to £54,198.

The accounts of the subsidiary, Britannia Lead Co. Ltd., show that free reserves have increased by £35,216 to £251,045.

After charging £4,762 for depreciation and £85,362 for taxation the net profit was £78,966. £41,250 net was distributed as a dividend to Mining Trust, £2,500 was appropriated to the Group Provident Trust Fund, and £35,216 was carried forward in the appropriation account.

MOUNT ISA MINES LTD.

Your company holds £917,632 Eight per Cent First "B" Redeemable debenture stock, £600 Four and a-Half per Cent Ten-Year Guaranteed Sterling debentures and £A116,463 Ordinary stock in Mount Isa Mines. The mine made a net profit for the twelve months ended June 30, 1950, of £A770,758 after allowing for £A125,314 for interest on debentures, £A400,000 for depreciation, £A668,883 for lead price bonus to employees and £A520,000 for taxation. Out of the profits for the year a dividend of 15 per cent, which absorbed £A736,183, was paid.

The production of metals for the year aggregated 2,583,466 oz. silver, 33,606 tons of lead, 582 tons of copper and 41,743 tons of zinc concentrates. Published ore reserves fell from 9,663,287 tons to 9,169,698 tons, but the chairman of Mount Isa Mines in his speech to shareholders at the annual general meeting makes this observation upon the ore reserves: "The fact that the reported ore reserves reflect a reduction amounting approximately to ore extracted during the period should not be construed as an indication that the tonnage now published as reserves represents the ultimate possibilities of the Mount Isa ore occurrence. Exploration has not yet delimited ore extensions either vertically or laterally, and we have every geological and structural reason to believe that additional volumes will be developed as greater depth is reached."

NEW GUINEA GOLDFIELDS

Considerable progress was made in reconstruction by the New Guinea Goldfields Co. and a small profit, after providing for depreciation, of £A4,903 was made, compared with the loss of £A33,610 for the preceding year. Development work was continued at the Upper Ridges Mine and had to September 30 last indicated a tonnage of over 100,000 tons assaying 9 dwt. Au. per ton. Treatment tests on this ore show that about 75 per cent of the gold content can be recovered by amalgamation, and a mill to treat 100 tons per day is being constructed.

Big Bell Mines Ltd., in which your company has a small interest, milled 359,082 long dry tons having an average gold content of 3.13 dwt. per long ton, and earned a profit of £A72,112. This profit was transferred to surplus and no dividend distribution was made.

While not looking for any immediate spectacular increase either in income or capital assets, your directors feel that Mining Trust is well placed to take advantage of any new business which may be offered to it, and that pending the investment of some of its present cash resources the company should continue to receive during the coming year satisfactory dividends from Mount Isa, Britannia Lead Co. and other companies in which it is interested.

The report and accounts were adopted.

GENERAL MINING AND FINANCE CORPORATION

(Inc. in the Union of S.A.)

DIVIDEND MAINTAINED AT 25 PER CENT

The 51st ordinary general meeting of the General Mining and Finance Corporation Ltd. was held on June 5, in Johannesburg.

Mr. C. S. McLean, deputy chairman, presided, and in the course of his speech said:—Revenue for the year at £638,806 was greater by £67,541 than that for the previous year. After deducting administration expenses totalling £125,806, a profit of £513,000 was carried to appropriation account. When added to the balance of £153,373 brought forward from the previous year, an amount of £666,373 was available for distribution. The dividend distribution for the year was maintained at 25 per cent which, on the increased capital, absorbed £419,321.

The corporation's investments in stocks, shares and Government and Municipal Securities appear in the balance-sheet at £4,130,993, an increase of £222,148 when compared with the corresponding figure for the previous year.

INCREASED COSTS

As was pointed out at the last annual meeting, the full benefits arising from devaluation could only be maintained if working costs were held at the then existing level. Between the time of devaluation and the month of June last year costs had increased by approximately 21s. 2d. per ounce fine, the greater proportion of which was attributable to an adjustment in the scale of wages and other benefits granted to both European and non-European employees. In June, 1950, working costs per ounce fine averaged 156s. 4d. but the corresponding figure for December, 1950, was 162s. 5d. with an average of 157s. 3d. for the whole of that year. This compares with 136s. 9d. for the year 1949.

The upward trend of costs has continued and for the three months ended March, 1951, these amounted to 164s. 4d. per ounce fine or 31s. 1d. per ton milled, this being an increase of 1s. 6d. per ton milled, equivalent to 7s. 1d. per ounce fine, over the 1950 average.

The additional revenue received by the industry from gold sold for artistic and industrial purposes at enhanced prices, has increased substantially during the current year when compared with 1950, and has been more than sufficient to offset the increased costs.

South Africa's prosperity is so closely bound up with a prosperous gold industry that it is to be hoped that the price of gold will soon be improved to a level more in keeping with its true worth.

OTHER INTERESTS

There are at present 13 mines in various stages of development in the Orange Free State and it is hoped that at least two will reach production this year. Your corporation has interests in all these mines. The results obtained from the inter-sections of reef through shaft-sinking and disclosures from development are distinctly promising.

The Chairman then referred to the affairs of the companies in which the corporation is mainly interested, namely: Van Ryn Gold Mines Estate Ltd., West Rand Consolidated Mines Ltd., East Rand Proprietary Mines Ltd., Durban Roodeport Deep Ltd., Crown Mines Ltd., South Roodeport Main Reef Areas Ltd., General Exploration Orange Free State Ltd., and Consolidated Rand Investment and Trust Company Ltd.

The report was adopted.

The report of the proceedings of this meeting will not be circulated to shareholders, but copies may be obtained on application to the London Office, Winchester House, Old Broad-street, E.C.2.

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MARTHA GOLD MINING CO. (WAIHI)

The Ordinary General Meeting of Martha Gold Mining Co. (Waihi), Ltd., was held at 48, Gresham Street, London, E.C.2 on Tuesday last.

Mr. G. R. Mitchison, K.C., M.P. (Chairman), who presided said:—

The year under review was a difficult and anxious one at the mine. The tonnage extracted was over 3,000 tons less than last year, mainly because of the continued and increasing shortage of skilled labour. It was well below the capacity of the plant. In such a state of affairs there is of course no corresponding reduction in standing overhead charges. Wage rates were higher, as the result of an interim wage increase of 5 per cent applied from May, 1950. The shortage of labour involved additional overtime. Stores were more expensive. Moreover, you will remember that during 1949 before devaluation we started "to pick the eyes of the mine" and accordingly suspended the development necessary to carry on mining operations. In consequence the cost of development work this year shows an increase of £7,000. All these factors are reflected in an increase of mining costs from about 58s. 2d. per ton in 1949 to about 64s. 8d. in 1950. In that increase of 6s. 6d. per ton about 2s. 7d. represents the increase in development costs.

In the result the profit for the year, before reckoning taxation, was only £16,160 as against £38,626 in 1949. We propose to appropriate £2,000 to the Staff Fund (which needs it, if only in view of the increased cost of living) and, after providing for taxation at a reduced figure corresponding to our reduced profits, we recommend a dividend of 2d. per share, free of Income Tax. In order to pay that dividend we shall have to take about £1,400 from the credit balance brought forward from 1949; the balance carried forward to 1951 will be £9,642.

Other items in the balance sheet call for little comment. The increase in the value of cyanide and other stores reflects an increase of price rather than of quantity. The increase in investment reserve is due to the sale of New Zealand stocks bought when the New Zealand pound was of lower value in terms of sterling. The proceeds have not been re-invested, so that cash shows an increase and investments a decrease.

You will expect me to say something about the course of events since the end of 1950 and about immediate prospects. Our difficulties have increased. The most crucial question is the continued shortage of labour, particularly skilled labour. In February, 1951, a further Dominion Award substituted an increase of 15 per cent in wage rates for the previous 5 per cent and that means an increase in costs of somewhere about 4s. 8d. per ton, with a corresponding decrease in the amount of ore worth mining. Stores have continued to increase in price and dock strikes in New Zealand have caused serious and menacing delay in deliveries. Prospects are certainly not bright and you will appreciate that, if last year the sale of £300,000 worth of bullion showed only £16,000 profit before taxation, the margin upon which we work is very small. Clearly we run some risk of a loss this year and it is exceedingly difficult to not impossible, to say how events will develop. In the circumstances our very experienced staff in New Zealand, Mr. Banks and his colleagues, have given the most anxious, detailed and vigilant consideration to the question of the maintenance of operations. It is a question of when we begin again to pick the eyes of the mine, as we did for a few months in 1949 before devaluation, preparatory to closing down for good. All I can say at present is that, on the advice we have received and on our own responsibility, we propose to continue ordinary mining operations for the time being. Obviously in the circumstances I have described the continuance will not be long, but I think that it would be neither prudent on my part nor in your own best interests to attempt any more definite or detailed forecast.

Year by year at these meetings I have tried to express our deep appreciation of the services of Mr. Banks, our Superintendent Mr. Lowrie, Mr. Waite the Mine Manager and the other members of the staff at the mine and the mill. They are modest men and I sometimes wonder if they know how much I mean it. It is no easy matter not only to face ever-increasing difficulties and make the best of them, but also from time to time to stand aside for a moment, look at the matter as a whole and give upon it the sound advice, which we have always had from them. I described 1949 as an exceptionally trying and difficult year. 1950 was just as bad and 1951 looks even worse, from their point of view. I can only say, once more, how sincerely grateful we are—and I am sure I speak for you, as well as for my fellow-Directors—for such consistent, loyal and hard-working service, not only from each of them separately but from all of them working as well together as they always do. They have and they deserve our complete confidence.

The Report and Accounts were adopted.

GOLDFIELDS AUSTRALIAN DEVELOPMENT CO. LTD.

The Eighteenth Annual General Meeting was held at Winchester House, London, E.C.2, on Tuesday, June 26.

Mr. R. H. A. Neuschild (Chairman of the Company) presided, and in the course of his address said:

All operations in Western Australia are conducted through Moonlight Wiluna Gold Mines, Ltd., the entire capital of which Company is owned by Gold Fields Australian Development Co., Ltd., I would draw attention to the increase during the year of the amount of our advances to the Moonlight Co., these having increased by £55,200 to £190,869 with a corresponding decrease in cash at bankers. No dividend income was received by us from the Moonlight Co., and in consequence we show a loss for the year of £3,928, which increases the total loss to be carried forward to £28,070.

To deal with the accounts of the Moonlight Co. the net loss for the year is £18,109, which increases the total loss carried forward to £123,767. As you will see from the balance sheet, the one-third interest in Porphyry (1939) Gold Mine, No Liability, had, to December 31, 1950, cost £89,793, an increase of £20,003 over the year.

At Porphyry results of development are not yet forthcoming because of the enforced cessation of operations due to inability to secure sufficient labour for shaft sinking and development work.

Mount Ida provides a contrast to my previous remarks regarding our interests, as although there has not been a lack of problems with which to contend, productive operations have continued on a steady basis since the mill was started up in June of last year. In addition, development work has been carried on concurrently with mining and very shortly the deepening of the main shaft from 700 ft. to 900 ft. will be taken in hand.

Opportunity was taken of the recent visit to this country of the Premier of Western Australia to lay before him a number of facts, and as he is so well aware of the many benefits to Western Australia of the gold mining industry, I am encouraged by his remark that the Western Australian Government is out to help. The shortage of labour there, in every direction, is, however, a difficulty for which there is no ready solution, despite considerable immigration.

The Report and Accounts were adopted.

PENGKALEN LTD.

MR. STANLEY WICKETT'S REVIEW

The Forty-third Ordinary General Meeting of Pengkalen, Ltd., was held on June 22, 1951 at the Registered Office, Redruth.

Mr. Stanley Wickett (Chairman), presided.

The Report and Accounts for the year ended September 30, 1950, having been circulated for the prescribed time, were taken as read, as was also the Chairman's Statement, circulated with the report and accounts, which was as follows:

The Statement of Accounts submitted herewith for the year ended September 30, 1950, shows a mining profit (after payment to the Malayan Government of £39,253 in respect of Government Royalty on ore sales) of £162,505, against a mining profit of £77,259 for the previous year. United Kingdom taxation absorbed £94,974. Malayan and United Kingdom taxation required a total of £134,227, whereas the Shareholders only received £43,450 nett in dividends.

£20,000 has been transferred to General Reserve, bringing this account up to £76,884. £2,266 has been written off Capital Expenditure, bringing the total Capital Expenditure down to the very modest figure of £50,001.

The balance standing to the credit of Profit and Loss Account has been increased from £18,536 to £20,851.

The returns of tin ore since the end of the year under review have been:

October-December, 1950 ... 2,120 piculs (126½ tons)
January-March, 1951 ... 2,380 piculs (141½ tons)

From the General Managers' Report it will be seen that good outputs may be anticipated during the current year.

The advance received from the Malayan Government stands at the figure of £65,929 while at the close of the accounts expenditure carried forward in suspense on Rehabilitation account amounted to £91,273, included in the Company's claim for War Damage. Assessment of the claim is awaited, but under the terms of an announcement made by the Malayan Government it appears that owing to limitation of funds compensation for damage suffered as the result of Japanese occupation will be drastically scaled down.

In consequence of conditions prevailing in Malaya, the high cost of living and bandit activity, your Directors have authorized the payment of a Special Gratuity, at the General Managers' discretion, to the Staff at the Mine of two months

salary in respect of the calendar year, 1950. I am confident the Shareholders will heartily endorse this decision. The Staff also participate in the Malayan Tin & Rubber Provident Fund and a Pension Scheme.

The Statement of Accounts and Balance Sheet, together with the Directors' Report, were received and adopted.

ANGLO AMERICAN CORPORATION GROUP OF COMPANIES DECLARATION OF DIVIDENDS

NOTICE IS HEREBY GIVEN that Dividends have been declared payable to shareholders registered in the books of the undermentioned companies at the close of business on June 30, 1951.

The Dividends are declared in the currency of the Union of South Africa and become due on July 2, 1951. Warrants will be posted from the Head and London Offices on or about August 8, 1951.

The Dividends are payable subject to the usual conditions, which can be inspected at the Head and London Offices of the Companies.

The Transfer Books and Register of Members will be closed in each case from July 2, 1951 to July 7, 1951, both days inclusive. Holders of Share Warrants to Bearer are notified that the Dividends are payable at Barclays Bank (Dominion, Colonial and Overseas), Circus Place, London Wall, E.C.2, or at the Banque de l'Union Parisienne, 6 and 8 Boulevard Haussmann, Paris, on or about August 9, 1951, the respective coupons being as set out in the following tabulation. Coupons must be left four clear days for examination.

Name of Company (Each of which is incorporated in the Union of South Africa)	Dividend No.	Share Warrant Coupon No.	Per Cent	Rate of Dividend Per Share in Union of South Africa Currency	Effective Rate Non-Resident Shareholders' Tax
Anglo American Investment Trust Ltd.	23	—	20	4/- per £1 share	6.075%
Brakpan Mines Ltd.	77	77	20	1/- per 5/- share	7.5%
Daggafontein Mines Ltd.	37	37	60	3/- per 5/- share	7.5%
East Daggafontein Mines Ltd.	23	—	13½	1/4½ per 10/- share	7.5%
The New Era Consolidated Ltd.	62	—	10	6d. per 5/- share	6.8%
Springs Mines Ltd.	59	59	7½	4½d. per 5/- share	7.5%
The South African Land & Exploration Co. Ltd.	28	28	57 1/7	2/- per 3/6 share	7.5%
W. Reefs Exploration & Development Co. Ltd.	20	—	25	1/3 per 5/- share	7.5%
West Rand Investment Trust Ltd.	7	—	6½	7½d. per 10/- share	7.5%

By Order of the Boards,

Anglo American Corporation of South Africa Ltd.

London Office,

11, Old Jewry, E.C.2.

June 22, 1951.

W. E. GROVES,

London Secretary

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LTD.

(Incorporated in the Union of South Africa)

NOTICE TO STOCKHOLDERS

SIX PER CENT CUMULATIVE PREFERRED STOCK DIVIDEND No. 44

NOTICE IS HEREBY GIVEN that DIVIDEND No. 44 of 3 per cent, for the half-year ending June 30, 1951, being at the rate of 6 per cent per annum, has been declared payable to stockholders registered in the books of the Corporation at the close of business on June 30, 1951, and to persons presenting Coupon No. 44 from Stock Warrants to Bearer.

The Dividend is declared in the currency of the Union of South Africa and becomes due on July 2, 1951. Warrants will be posted from the Head and London Offices on or about August 8, 1951.

The Dividend is payable subject to the usual conditions which can be inspected at the Head and London Offices of the Corporation.

The Transfer Books and Register of Members will be closed from July 2 to 7, 1951, both days inclusive.

Holders of Stock Warrants to Bearer are notified that the Dividend is payable at Barclays Bank (Dominion, Colonial and Overseas), Circus Place, London Wall, E.C.2, or at the Banque de l'Union Parisienne, 6 and 8 Boulevard Haussmann, Paris, on or about August 9, 1951. Coupons must be left four clear days for examination.

The effective rate of Non-Resident Shareholders' Tax is 6.9 per cent.

By Order of the Board.

London Office,

11, Old Jewry, E.C.2.

June 22, 1951.

W. E. GROVES,

London Secretary

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